calculation. The Functional Pulse Generator also sends synchronizing pulses to the ADCs to start the digitizing of analog signals at the end of the time interval between trimming pulses (before the next trimming pulse is applied).

Similarly to the above-described FIG. **11**, FIGS. **13** and **14**, and their associated description, show an example of how the more elementary principles in FIGS. **5-10** are used together to effectively adjust a certain parameter (not limited to resistance), of a system larger than just a resistor or resistors. In FIGS. **13** and **14**, the goal of the trimming is to balance a Wheatstone bridge, in order to tune the output voltage of an amplifier (labeled "A" in FIG. **12** and again in FIG. **16**).

Accordingly, FIG. **16** shows a schematic block diagram of the circuitry needed for trimming resistors in a bridge configuration. The circuitry is designed to trim either (or both) of the two resistors R_{x1} or R_{x2}. The Functional Pulse Generator (function generator), therefore has two output channels. The output voltage is measured by the ADC and stored in memory. Again there are three decision-making modules.

The first decision-making module calculates voltage pulse amplitude to be applied to the auxiliary heater R_{h1} or R_{h2} for the purposes of trimming of the bridge. The voltage pulse amplitude is a function of:

actual (most-recent measured) voltage U_{actual},

target voltage U_{target} (e.g. $U_{target}=0$ or some other predetermined value),

voltage measured after previous trimming pulse $U_{previous}$ (stored in the memory)

and voltage pulse amplitude of one or more previous pulses $U_{pulse\text{-}history}$

The second decision-making module calculates pulse width as function of:

U_{actual},

U_{target},

$U_{previous}$

and $t_{pulse\text{-}history}$

The third decision-making module calculates interval between pulses as function of:

U_{actual},

U_{target},

$U_{previous}$

The pulse parameters, U_{pulse}, t_{pulse} and $t_{interval}$ are sent to the Functional Pulse Generator. Parameters U_{pulse} and t_{pulse} are stored in memory to be used in the next pulse parameters calculation. The Functional Pulse Generator also sends synchronizing pulses to the ADCs to start the digitizing of analog signals at the end of the time interval between trimming pulses (before the next trimming pulse is applied).

The choice of a certain output channel for connection of the Functional Pulse Generator can be done manually, or automatically using certain application-specific criteria. For example, balancing a bridge can in general be done by adjustment of R_{x1} alone, or R_{x2} alone, or both.

By using the techniques described in the text above, it is possible to obtain high-precision adjustment (e.g. better than 100 ppm, such as 10-50 ppm), that is also bi-directional over a substantial range (e.g. 20% to 30%, or more, of the resistance value), and executable many times (e.g. 100 times or more), and where each adjustment is executable in a short time (e.g. less than one minute). Also, by using the techniques described in the text above, it is possible to obtain a high-precision adjustment that is bi-directional to a precision of better than 10 ppm in less than 10 seconds over a narrow or moderate adjustment range (e.g. less than 5%)

In general, it should be understood that there are many ways in which to realize the principles outlined above. This applies to each of the elementary techniques exemplified in FIGS. **5-10**, and to full trimming sequences such as described in FIGS. **11** and **13**, (which would use circuits such as described in FIGS. **15** and **16**, respectively), and also to the implementations of trimming circuitry to trim resistance or larger systems (e.g. the circuitry described in FIG. **16** gives an example how resistor trimming can be used to adjust a certain parameter of a system larger than just a resistor or resistors, where the goal of the trimming circuitry is to balance the resistor bridge in order to tune the output voltage of the amplifier A to zero.)

It will be understood that numerous modifications thereto will appear to those skilled in the art. Accordingly, the above description and accompanying drawings should be taken as illustrative of the invention and not in a limiting sense. It will further be understood that it is intended to cover any variations, uses, or adaptations of the invention following, in general, the principles of the invention and including such departures from the present disclosure as come within known or customary practice within the art to which the invention pertains and as may be applied to the essential features herein before set forth, and as follows in the scope of the appended claims.

The invention claimed is:

1. A method for trimming a parameter of a resistor made from a thermally mutable material, the method comprising:

(a) in a first step, subjecting said resistor to a high first temperature by applying at least one heat pulse, to trim said parameter of said material in a first direction away from an original value;

(b) in a second step, subjecting said resistor to a second temperature lower than said high first temperature by applying at least one heat pulse, so as to trim said parameter of said material in an opposite direction back towards said original value with a rate of change in said parameter that is initially rapid and gradually decreasing to a first level; and

(c) in a third step, subjecting said resistor to a third temperature lower than said second temperature by applying at least one heat pulse, so as to trim said parameter in said opposite direction with said rate of change in said parameter that is greater than said first level.

2. A method as claimed in claim **1**, wherein steps (b) and (c) are repeated with increasingly lower second and third temperatures.

3. A method as claimed in claim **2**, wherein said increasingly lower second and third temperatures are selected to optimize a total trimming time.

4. A method as claimed in claim **2**, further comprising selecting a predetermined number of iterations for said steps (b) and (c).

5. A method as claimed in claim **2**, wherein said at least one of said first temperature and said second temperature is substantially near an upper threshold of applied temperature in order to maximize said trimming range of said parameter.

6. A method as claimed in claim **5**, wherein said steps (b) and (c) are repeated until said resistor is subjected to a temperature approaching a lower temperature threshold for trimming, and a number of changes of temperature is selected to maximize said trimming range.

7. A method as claimed in claim **5**, wherein a difference between said second temperature and said third temperature is optimized to maximize said trimming range.

8. A method as claimed in claim **1**, wherein step (b) comprises regularly returning said resistor to a predetermined ambient temperature, measuring the parameter, and determining the rate of change, so as to decide whether to go on to step (c).